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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Appln. Of: WILSON et al.
Serial No.: 09/896,375
Filed: June 29, 2001
For: IMPROVED FLAVORING COMPOSITION AND PROCESS FOR BREWING MALT BEVERAGES
Group: 1761
Examiner: SHERRER, Curtis Edward DOCKET: STEINER 00.01

MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
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TRANSMITTAL LETTER

Dear Sir:

In connection with the above-entitled matter, enclosed please find the following:

1. Three copies of Appellants' Brief on Appeal and **Appendices A - M**; and
2. Credit Card Payment Authorization Form PTO-2038 in the amount of \$165.00 to cover the cost of filing the Appeal Brief.

In the event there are any fee deficiencies or additional fees are payable, please charge them (or credit any overpayment) to our Deposit Account No. 08-1391.

Respectfully submitted,

Norman P. Soloway
Attorney for Appellant
Registration No. 24,315

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567



Serial No. 09/896,375
Docket No. STEINER 00.01
Appeal Brief - Transmittal Letter

CERTIFICATE OF MAILING

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By 

NPS:sb

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567



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APPELLANTS' BRIEF ON APPEAL

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

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HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

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HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

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APPELLANTS' BRIEF ON APPEAL

This Brief is being filed in support of Appellants' Brief from the Final Rejection mailed May 3, 2004. A Notice of Appeal was timely mailed under Certificate of Mailing on July 27, 2004.

REAL PARTY IN INTEREST

The Real Party in Interest in this Appeal is S.S. Steiner, Inc., a New Jersey Corporation who took by way of assignment from the inventors recorded in the USPTO on December 27, 2001 at Reel 012399, Frame 0132.

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HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

RELATED APPEALS AND INTERFERENCES

To the best of the knowledge of the undersigned attorney and the Appellants, no other Appeals or other Interferences exist which will affect or be directly affected, or have a bearing on the instant Appeal.

STATUS OF THE CLAIMS ON APPEAL

Claims 17, 18 and 20-22 stand finally rejected.¹ Claims on Appeal are set forth in Appendix A.

STATUS OF THE AMENDMENTS

A Final Action was mailed May 5, 2004. Appellants elected to proceed with an Appeal rather than file an After Final Amendment.

BACKGROUND OF THE INVENTION ON APPEAL

Hops have been used for centuries for the purpose of contributing a clean bitter taste to beer. Materials extracted from hops during a conventional brewing process include certain compounds referred to in the art as “ α -acids” and “ β -acids” in combination with numerous non-acidic organic compounds including fats, waxes, uncharacterized resins and steam volatile essential oils. During the wort boil, α -acids isomerize to compounds referred to in the art as “iso- α -acids”. Unfortunately, malt beverages brewed with normal hop products can develop “light-struck” flavors on exposure to light. These off-flavors are thought to be primarily caused by the photolytic action of near-UV wavelengths of light splitting off part of the isohexenoyl

¹ The Final Office Action Summary at Cipher 6 and the detailed rejection at page 3 refers to “claims 17-22”. However, claim 19 was cancelled in Amendment C which was filed prior to and resulted in issuance of the Final Rejection.

side chain of the "iso- α -acids". The resulting dissociated 1,1-dimethylallyl radical then reacts with naturally present compounds containing sulphhydryl (-SH) groups to form a highly pungent mercaptan, 3-methyl-2-butene-1-thiol (MBT), which results in a sulphury aroma that is commonly described as "skunky" and generally considered to be unpleasant. (Specification, page 1, line 12 - page 2, line 18).

It has been customary for many years to use hop extracts instead of natural hops for brewing purposes. The use of extracts has a number of advantages, not only economic, but also with respect to brewing techniques and quality and reproducibility of product.

Several extraction procedures have been developed for extracting the resin portions and essential oils from the natural hop. After extraction, the isolated α -acids can be isomerized to form iso- α -acids which are known to impart the major portion of the traditional "bitter" taste to beer. However, iso- α -acids also are light-unstable. Accordingly, the prior art has developed various methods for converting the α -acids, iso- α -acids and β -acids to tetrahydroiso- α -acids or hexahydroiso- α -acids which have much improved light stability.

These reduced forms of iso- α -acids are resistant to the above-described photolytic action and hence beers brewed with these types of hydrogenated iso- α -acids materials do not as easily develop MBT derived off-flavors. The current commercial practice is for these compounds to be marketed as mildly alkaline, aqueous solutions of their potassium salts in the same way as is also done for iso- α -acids. Their solubility is rather more limited, though. Hence, for example, tetrahydrosiso- α -acids are normally sold at a strength of 10% w/w, while iso- α -acids are commonly offered as stable solutions at a strength of 30% w/w. Because these compounds are substantially less soluble than are iso- α -acids, it is normal practice to add them

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

directly to fermented beer rather than to the unfermented wort (whether before, during or after the normal kettle boil) thereby avoiding an otherwise inevitable and substantial loss of bittering substances through precipitation. However, this is an inconvenience since it is necessary to install and operate specialized dosing equipment to make the additions. Furthermore, the subsequently produced beer will be lacking in the traditional "hoppy" notes deriving from the residual hop oils that would normally be present as a consequence of the addition of hops, hop pellets or hop extracts to the wort before the end of the boil. (Specification, page 3, line 19 - page 4, line 10).

The prior art also teaches that a light-stable beer can be produced from so-called (*Rho*-)iso- α -acids, dihydrogenated derivatives that have been prepared by chemical reduction of iso- α -acids using sodium borohydride. (*Rho*-)iso- α -acids are more soluble than are tetrahydroiso- α -acids or hexahydroiso- α -acids and are usually sold commercially at a concentration of 35% (w/w) as measured by non-specific spectrophotometric ("Spectro") analysis (but are usually found to have a true strength typically in the range 23 - 30%, as determined by HPLC). However, such solutions often precipitate during storage, necessitating inconvenient heating to re-dissolve the precipitate before the product can be used as a post-fermentation additive. (Specification, page 4, line 11 - page 5, line 3).

SUMMARY OF THE INVENTION ON APPEAL

The present invention provides a process for the production of a stable, high solids content, partially aqueous composition containing reduced (*Rho*-)iso- α -acids. The resulting high concentration, room temperature stable, partial aqueous composition may be used directly

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

in a brewing process to make a light-stable beer having the usual hoppy or "bitter" taste. (Specification page 6, lines 4-12).

More particularly, the present invention provides a process for forming a stable, high solids content of partially aqueous composition containing reduced (*Rho*)-iso- α -acids by heating a concentrated solution of reduced (*Rho*)-iso- α -acids in their free acid form to fluid state. A concentrated aqueous alkali metal hydroxide solution is added to the heated solution of reduced (*Rho*)-iso- α -acids, with stirring, whereby to form a concentrated solution containing an alkali metal salt of the reduced (*Rho*)-iso- α -acids. (Specification, page 7, lines 2-page 8, line 16 and Fig. 1).

The resulting high solids content, partially aqueous alkali metal salts of said reduced (*Rho*)-iso- α -acids are stable at room temperature. That is to say, the aqueous mixture remains as a single phase. (Specification, page 8, line 21 - page 9, line 2). As will be discussed below the tendency of aqueous solutions of alkali metal salts of reduced (*Rho*)-iso- α -acids to precipitate out of solution at much lower concentrations is a well-known phenomenon. The ability to prepare, package, store and ship reduced (*Rho*)-iso- α -acids in a semi-fluid state at a multiple of the normal concentrations results in significant savings, packaging, storage and transportation costs. (Specification, page 9, lines 6-20).

ISSUES PRESENTED ON APPEAL

- (1) Whether claims 18, 20 and 22 are indefinite under 35 USC § 112, second paragraph.

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

(2) Whether claims 17, 18 and 20-22² are unpatentable under 35 USC § 103 as being obvious from Maye et al. U.S. Patent 5,583,262.

THE FINAL ACTION

(1) In the Final Action, the Examiner rejected claims 18, 20 and 22 under 35 USC § 112, second paragraph as being indefinite. More particularly, claim 18 was rejected as being indefinite as including the terms "substantially" and "slightly". Claim 20 was rejected as being indefinite as including the term "room temperature". And, claim 22 was rejected as being indefinite due to the presence of term "about".

(2) Claims 17-22 (more correctly claims 17, 18 and 20-22) were rejected as being obvious from Maye et al. The rejection, which incorporates by reference the previous rejection cites Maye et al. as teaching in Examples 5-8 "mixing aqueous alkaline solutions of about 35 - 40 (*Rho*)-iso- α -acids with 6M aqueous solutions of metal salt at 65C (sic) with stirring. See also Col. 5, lines 16-31. The resulting mixture has a small pH of above 5 id. The temperature of the final mixture would inherently be room temperature." (Paper number 13 incorporated by reference at page 3 of the Final Action).

The rejection acknowledges at page 3 of the Final Action that Appellants' claims are distinguished from Maye et al. in requiring heating the iso- α -acids before adding the alkali metal hydroxide solution to the heated acids; however, the Examiner takes the position that the order of mixing ingredients is *prima facie* obvious in the absence of new or unexpected results (citing *In re Burhans*, 154 F.2d 690, 69 USPQ 30 (CCPA 1946) and *In re Gibson*, 5 USPQ 230 (CCPA 1930)).

² The Final Action rejects claims "17-22". However, as noted *supra* claim 19 was previously cancelled and therefore forms no part of this Appeal.

The rejection also acknowledges that Maye et al. teaches steps not recited in the claims but states:

“The instant claims are broad in that the preamble uses the phrase “comprising,” which is open ended and does not exclude other steps.”

(See the paragraph bridging pages 3-4 of the Final Action).

Finally, the Final Action notes:

“Applicants also state “the substitution of metal salts such as those that are used by Maye simply would not provide Applicants’ claimed process.” Applicants comment on Ex. 7 of Maye to argue this point. Applicants must analyze Maye’s disclosure taking into account all the teachings within the four corners of the patent. No data was supplied to support this argument, but rather only opinion, and this is given little weight...if applicants’ process requires specific elements to be present for the claimed process to be operable, then they should appear in the independent claim.”

GROUPING OF CLAIMS

All of the claims on Appeal stand or fall together.

THE REFERENCES

U.S. Patent No. 5,583,262

U.S. Patent No. 5,583,262 to Maye et al., the sole applied reference, discloses a process for converting reduced iso- α -acids into their potassium salt by mixing aqueous alkaline solutions of about 35 - 40 % (*Rho*-)iso- α -acids with 6M aqueous solutions of metal salts heated to a temperature between about 65 - 70°. Accordingly to Maye et al., this results in the formation of two layers, an upper concentrated oil layer and a lower dilute aqueous layer. The two phases are separated, aqueous phase is discarded, and the upper concentrated oil phase collected and dried, for example, by rotary evaporation or spray drying.

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

ARGUMENTS ON APPEAL

(1) The rejection under 35 USC § 112, second paragraph, as being indefinite is in error.

Each of the objected to terms is found in many U.S. patents. For example, a recent search of the USPTO database for patents having claims containing the term "about" showed 717,076 U.S. patents issued since 1976 with the term "about" in the claims. The term "room temperature" is found in the claims of 17,833 patents issued since 1976. The term "substantially" is found in the claims of 799,112 patents issued since 1976. And, the term "slightly" is found in the claims of 53,047 patents issued since 1976 and the term "slightly alkalize" found in 75 U.S. patents issued since 1976. Printouts of the first page of the above mentioned PTO database searches are enclosed as **Appendices B-E** for the convenience of the Board.

In the rejection the Examiner acknowledges "the voluminous number of U.S. patents that contain said [i.e., the objectionable] terms in their claims". However, the Examiner takes the position "This evidence in and of it self (sic) is not persuasive, as the specifications or prosecution history may well provide the metes and bounds of said terms. If said terms are not part of the inventive concept, they are also then not held to be indefinite." The Examiner's rejection is, frankly, not understood. While the several terms are found in the claims, Appellants have not argued any of the terms per se as being part of the "inventive concept". Thus, on this basis alone, and as acknowledged by the Examiner, the terms should not be held to be indefinite.

Moreover, several of the U.S. patents of record in this application have claims including the term "about", "substantially", and "approximately". See, for example, claims 6 and 9 of

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

U.S. patent 3,044,879 (**Appendix F**). See also claims 13 and 18 of U.S. patent 4,104,409 (**Appendix G**). And, see claim 5 of U.S. patent 4,282,259 (**Appendix H**), claims 2 and 3 of U.S. patent 4,324,810 (**Exhibit I**), claims 1 and 3 of U.S. patent 4,759,941 (**Appendix J**), claims 1, 8, 9, 18 and 19 of U.S. patent 4,918,240 (**Appendix K**), claims 1, 4, 6, 10, 21, 22, 25, 26 and 31 of U.S. patent 5,013,591 (**Appendix L**), and claims 3, 5, 6, 7, 8, 9, 10, 11, 12, 13 and 14 of U.S. patent 5,200,227 (**Appendix M**).

Accordingly, it is submitted that the claims satisfy the requirements of 35 USC § 112, second paragraph and the rejection of the claims under 35 USC § 112, second paragraph is in error.

(2) The rejection of the claims as obvious from Maye et al. is in error.

Before considering the specific art rejection, it should be noted the present invention relates to a process for forming a stable, high solids content, partially aqueous solution containing an alkaline metal salt of a reduced (*Rho*)-iso- α -acid. Maye et al. does not teach that. Maye et al. reacts an iso- α -acid with an alkaline metal salt, not an alkaline metal hydroxide. Thus, Maye et al. produces a two phase product consisting of a dilute aqueous layer and a concentrated oil layer. Maye et al. then separates and discards the aqueous layer, and dries the concentrated oil layer.

Moreover, there are other distinctions. Maye et al. mix their iso- α -acids into a heated dilute alkali metal salt solution. Appellants claims on the other hand require heating concentrated solution of reduced (*Rho*)-iso- α -acids in their free acid form to fluid state and adding a concentrated aqueous alkaline metal hydroxide solution to the heated solution of reduced (*Rho*)-iso- α -acids. The clear language of Appellants claims necessarily require heating the concentrated solution of reduced (*Rho*)-iso- α -acids and then adding the aqueous alkaline

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

metal hydroxide solution. Reversing the sequence, i.e., adding the reduced (*Rho*)-iso- α -acids to a heated aqueous solution would not meet Appellants' claims. In suggesting that the order of mixing ingredients is *prima facie* obvious, the Examiner has ignored an essential limitation of Appellants' claims of (1) heating a concentrated solution of reduced (*Rho*)-iso- α -acids to fluid state, and then (2) adding a concentrated aqueous alkaline metal hydroxide solution "to said heated solution".

Thus, Appellants' claims are distinguished from Maye et al. in that:

- (1) Different materials are reacted;
- (2) The materials are heated and added in a different order; and
- (3) The resulting product is different.

Summarizing to this point, Maye doesn't teach heating a concentrated solution of reduced (*Rho*)-iso- α -acids and then adding a concentrated aqueous alkaline metal hydroxide solution to the heated solution of (*Rho*)-iso- α -acids, with stirring, as required by independent claim 17.

Moreover, the mention by Maye of pH 5 (Col 5, Line 23) clearly refers to the pH of the solution (of (*Rho*)-iso- α -acids) before addition of the salt solution, not afterwards as the Examiner states. (The starting solution is therefore not necessarily alkaline, as claimed by the Examiner). Hence the Examiner's reference in the fourth paragraph on page 3 of the Final Rejection to Maye's "above pH 5" statement is misplaced.

And, as noted *supra*, Maye's process results in the formation of two phases (aqueous and organic) which are then separated from one another, and the aqueous phase discarded. This point is made quite clear in those of Maye et al.'s examples that describe the full working of their process (see Examples 1 - 20). Dependent upon the metal salt used, in each and every

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

case Maye et al describe either the formation of two layers (see e.g. Example 5, line 34, Example 6, line 47) or a precipitate (see e.g. Example 8, lines 6-7).

Differences between Appellants' claimed invention and Maye et al. are also seen from the following table:

	Maye et al.'s process	Appellants' claimed process
Step 1	Heat aqueous alkaline solution.	Heat concentrated solution of reduced iso- α -acids in their free acid form to fluid state.
Step 2	Add the heated aqueous solution of alkaline metal salt to the hop acid to produce an organic phase and an aqueous phase.	Add aqueous hydroxide solution to form a concentrated (single phase) solution containing the alkaline metal salt of reduced iso- α -acids.
Step 3	Separate organic and aqueous layers and discard aqueous layer	Not Applicable
Step 4	Dry organic layer to obtain solid potassium salt.	Not Applicable

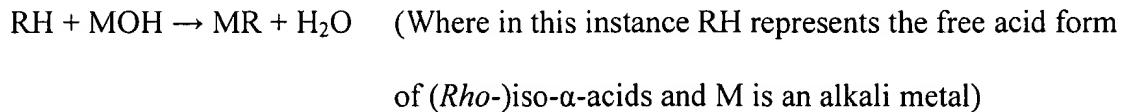
Thus, Appellants' claimed invention involves neither (1) the formation of nor (2) the separation of aqueous and organic phases. Nor does Appellants' claimed invention require a drying step. And, Appellants' claimed products are concentrated, aqueous solutions, as distinct from the dry solids prepared by Maye. (See '262, Col 5, Lines 14-15, wherein it is stated: "The total moisture content of the salt should be less than 2%.").

In rejecting the claims as obvious from Maye et al., the Examiner appears to substitute as equivalent solutions of metal salts in place of the concentrated alkali metal hydroxide solution. As has been made clear above, the process of Maye et al. is not the same as that of the Appellants. Secondly, the substitution of metal salts such as those that are used by Maye et al. produces different products and would not provide Appellants' claimed process.

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
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Appellants' claimed process begins with the free acid form of (*Rho*)-iso- α -acids and ends with their conversion to an alkali metal salt. The acids are therefore partially or totally neutralized according to the normal requirements of an acid/base reaction:



No anions other than those of the (*Rho*)-iso- α -acids themselves are present in Appellants' product. Maye et al. clearly would not produce the same result.

As pointed out by the CCPA in *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970) "All words in a claim must be considered in judging the patentability of that claim against the prior art". Here the Examiner has disregarded several words in Applicants' claim 17 in rejecting the claims as obvious from the art. The Examiner ignores the requirement of heating a concentrated solution of reduced (*Rho*)-iso- α -acids in their free acid form. The Examiner also ignores the claim requirements of adding a concentrated aqueous alkaline metal hydroxide solution to said heated solution of reduced (*Rho*)-iso- α -acids. And, the Examiner ignores the claim limitations that a concentrated solution containing an alkaline metal salt of said reduced (*Rho*)-iso- α -acids is formed (see claim 17).

Accordingly, it is submitted that the rejection of claim 17 and the several claims directly or indirectly dependent thereon as obvious from Maye et al. is in error.

HAYES SOLOWAY P.C.
130 W. CLUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

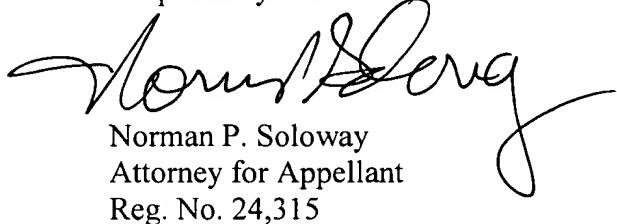
SUMMARY & CONCLUSIONS

Appellants' claims satisfy the requirements of 35 USC § 112, second paragraph, and are similar to numerous other U.S. patents that contain similar terms in their claims.

The applied prior art neither teaches nor suggests the claimed invention. The applied prior art starts with different materials, reacts them differently, and produces different products. Accordingly, the prior art clearly can neither achieve nor render obvious the claimed invention.

In view of the foregoing, it is respectfully requested that the Examiner's rejection of the subject application be reversed in all respects.

Respectfully submitted,



Norman P. Soloway
Attorney for Appellant
Reg. No. 24,315

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: MAIL STOP APPEAL BRIEF - PATENTS, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on September 1, 2004, at Tucson, Arizona.

By 

NPS:sb

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
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Alexandria, VA 22313-1450

APPENDIX A

(Claims on Appeal)

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

APPENDIX A

Claims on Appeal

Claim 17: A process for forming a stable, high solids content, partially aqueous composition containing reduced (*rho*-) iso- α -acids, comprising the steps of heating a concentrated solution of reduced (*rho*-) iso- α -acids in their free acid form to fluid state, and adding a concentrated aqueous alkali metal hydroxide solution to said heated solution of reduced (*rho*-) iso- α -acids, with stirring, to form a concentrated solution containing an alkali metal salt of said reduced (*rho*-) iso- α -acids.

Claim 18: The process of claim 17, wherein said concentrated aqueous alkali hydroxide solution is added to said reduced (*rho*-) iso- α -acids stepwise until a substantially neutral or slightly alkaline pH is attained.

Claim 20: The process of claim 17, further comprising the step of cooling said resulting, concentrated aqueous solution of the alkali metal salts of reduced (*rho*-) iso- α -acids to room temperature.

Claim 21: The process of claim 17, wherein said concentrated alkali metal hydroxide solution comprises potassium hydroxide.

Claim 22: The process of claim 21, wherein said potassium hydroxide comprises a saturated aqueous solution containing about 45 weight percent potassium hydroxide.

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

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Group: 1761
Examiner: Sherrer, Curtis Edward DOCKET: STEINER 00.01

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Alexandria, VA 22313-1450

APPENDIX B

(Search Results for the term "about")

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

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Alexandria, VA 22313-1450

APPENDIX C

(Search Results for the term “room temperature”)

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

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Alexandria, VA 22313-1450

APPENDIX D

(Search Results for the term “substantially”)

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

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APPENDIX E

(Search Results for the terms “slightly” and “slightly alkaline”)

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

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APPENDIX F

(U.S. Patent No. 3,044,879)

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

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APPENDIX G

(U.S. Patent No.4,104,409)

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

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APPENDIX H

(U.S. Patent No. 4,282,259)

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

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APPENDIX I

(U.S. Patent No.4,324,810)

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

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APPENDIX J

(U.S. Patent No. 4,759,941)

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

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APPENDIX K

(U.S. Patent No. 4,918,240)

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

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APPENDIX L

(U.S. Patent No. 5,013,571)

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

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APPENDIX M

(U.S. Patent No. 5,200,227)

HAYES SOLOWAY P.C.
130 W. CUSHING STREET
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567